Section I

Introduction

This introduction provides background information useful to prepare the reader for the following evaluation Sections II-IV. Main topics covered include:

- Background on the Portfolio Review Expert Panel (PREP) Process
- Background on CSREES and its funding authorities
- Portfolio Self-Review document organization

Background on the Portfolio Review Expert Panel (PREP) Process

New Accountability Requirements

The executive Office of Management and Budget (OMB) now requires Agencies to systematically examine and rate, via OMB's Program Assessment Rating Tool (PART- explained below), Agency efforts and ability to achieve the objectives, goals, and mission of the Agency. Agencies are also directed to conduct "independent" evaluations of their programs and report on these in the PART. This CSREES Portfolio Review Expert Panel (PREP) review is independent on several levels, as the Office of the Administrator has designed the PREP process, and has convened the external panels, commissioning self-review papers from relevant topic area managers as a key input into the process, and receiving the panel's report recommendations. The focus of the PREP is on OMB's primary interest, the outcomes and impacts of agency work, not on agency processes, such as the grants process, peer reviews to select proposals to be funded, or administrative functions such as hiring. OMB created the PART as a means to link budget and performance, improve programs, and revise or eliminate those which are not meeting their goals. All agencies must report quantitative performance measures in Budget and Performance Integration (BPI) charts as part of the annual budget justification process as well. The BPI is required by the President's Management Agenda (PMA), described below.

The four sections of OMB's Program Assessment Rating Tool are:

1. Program Purpose & Design
2. Strategic Planning
3. Program Management
4. Program Results.

CSREES Goal 1 Portfolio was reviewed in 2004; Goals 3 & 5 in 2005; and Goals 2 & 4 in 2006. The full PART checklist of questions to which the Agency must respond is available in the evidentiary materials. The score from this panel review will serve as a quantitative performance measure in the PART.

The President's Management Agenda is comprised of five goals, including budget and performance integration:

1. Strategic management of human capital
2. Competitive outsourcing
3. Improved financial management
4. Expanded electronic government
5. Budget and performance integration.

The PMA document is available in the evidentiary materials.

This review is an indicator of the emphasis the Agency places on good accountability and evaluation, and data availability that can be used to both meet external requirements and inform managers with feedback that they need to properly manage and improve their programs.

Using the Strategic Plan and Portfolios to Address Issues

In 2004, CSREES adopted a new Strategic Plan which is fully integrated with the USDA Plan, that is, the goals are the same and CSREES objectives are written to show how the Agency uniquely supports the same USDA objectives. Because the Agency must conduct and write a PART submission for each of its five goals, portfolios were created which best cover the work under each strategic objective. Portfolios of topically-linked issues are aligned to support the 14 USDA/CSREES Strategic Objectives, which support the five USDA/CSREES Strategic Goals. The portfolio and its component KAs demonstrate the complementary nature of research, education, and extension to solve national problems and to ensure that public investment is effective and efficient. The current Strategic Plan was used, although two other strategic plans were publicized by USDA during the 1999-2003 timeframe. Chart 1 presents a crosswalk of the two most recent USDA Strategic Plans, illustrating that, although the goals and objectives had undergone some rewriting, the underlying focus was quite similar. The Knowledge Areas (KAs) that serve as the basis for classifying work have remained essentially constant, although the list was reviewed and updated in 2004. (The CSREES Strategic Plans for 1997 – 2002, and 2004 – 2009 are included in the Evidentiary Materials)

Chart 1: Crosswalk of CSREES Strategic Goals and Objectives, 2004-2007 and 1997-2002 Strategic Plans

Strategic Goal 2004-2009	Strategic Goal 1997-2002	Objective
Goal 1 Enhance Economic Opportunities for Agricultural Producers	Goal 1 An Agricultural Production System That is Highly Competitive in the Global Economy	Objective 1.1, 2004-2009 Provide Information, Knowledge and Education to Help Expand Markets and Reduce Trade Barriers
		Objective 1.4, 1997-2002 To Improve Decision Making on Public Policy Issues Related to the Productivity and Global Competitiveness of the U.S. Agricultural Production System
		Objective 1.2, 2004-2009 Support International Economic Development and Trade Capacity Building Through Research and Technical Assistance
		Objective 1.3, 2004-2009 Provide the Science-Based Knowledge and Technologies to Generate New or Improved High Quality Products and Processes to Expand Markets for the Agricultural Sector
		Objective 1.1, 1997-2002 To Produce New and Value-added Agricultural Products and Commodities.
		Objective 1.4, 2004-2009: Provide Science-Based Information, Knowledge and Education to Facilitate Risk Management by Farmers and Ranchers
		Objective 1.5, 2004-2009 Contribute Science-based Information, Analysis, and Education to Promote the Efficiency of Agricultural Production Systems
		Objective 1.2, 1997-2002 To Increase the Global Competitiveness of the U.S. Agricultural Production System
		Objective 1.3, 1997-2002 To Recruit and Educate a Diverse Set of Individuals for Careers as Future Scientists, Professionals and Leaders Who Are Well-trained in Agricultural Sciences
Goal 2 Support Increased Economic Opportunities and Improved Quality of Life in Rural America	Goal 5 Enhanced Economic Opportunity and Quality of Life for Americans	Objective 2.1, 2004-2009 Expand Economic Opportunities in Rural America by Bringing Scientific Insights into Economic and Business Decision Making
		Objective 5.1, 1997-2002 To Increase the Capacity of Communities and Families to Enhance Their Own Economic Well-being
		Objective 2.2, 2004-2009 Provide Science-based Technology, Products and Information to Facilitate Informed Decisions Affecting the Quality of Life in Rural Areas
		Objective 5.2 1997-2002 To Increase the Capacity of Communities, Families, and Individuals to Improve Their Own Quality of Life

Chart 1: Crosswalk of CSREES Strategic Goals and Objectives (contd.)

Strategic Goal 2004-2009	Strategic Goal 1997-2002	Objective
Goal 3 Enhance Protection and Safety of the Nation's Agricultural and Food Supply	Goal 2 A Safe, Secure Food and Fiber System	Objective 3.1, 2004-2009 Reduce the Incidence of Foodborne Illnesses and Contaminants Through Science-based Knowledge and Education
		Objective 2.2, 1997-2002 To Improve Food Safety by Controlling or Eliminating Foodborne Risks
		Objective 3.2, 2004-2009 Develop and Deliver Science-based Information and Technologies to Reduce the Number and Severity of Agricultural Pest and Disease Outbreaks
Goal 4 Improve the Nation's Nutrition and Health	Goal 3 A Healthy, Well Nourished Population	Objective 4.1, 2004-2009 Improve the Nutritional Value of the U.S. Food Supply by Enhancing the Health Promoting Properties of Food Products
		Objective 4.2, 2004-2009 Promote Healthier Food Choices and Lifestyles Through Research and Education
		Objective 3.1, 1997-2002 To Optimize the Health of Consumers by Improving the Quality of Diets, the Quality of Food, and the Number of Food Choices
		Objective 3.2, 1997-2002 To Promote Health, Safety and Access to Quality Health Care
Goal 5 Protect and Enhance the Nation's Natural Resource Base and Environment	Goal 4 Greater Harmony Between Agriculture and the Environment	Objective 5.1, 2004-2009 Provide Science-based Knowledge and Education to Improve Management of Forest and Rangelands
		Objective 4.1, 1997-2002 To Develop, Transfer & Promote the Adoption of Efficient and Sustainable Agricultural, Forestry and Other Resource Conservation Policies, Programs, Technologies & Practices That Ensure Ecosystems Integrity and Biodiversity
		Objective 5.2, 2004-2009 Provide Science-based Knowledge and Education to Improve Management of Soil, Air, and Water to Support Production and Enhance the Environment
		Objective 4.2, 1997-2002 To Develop, Transfer and Promote Adoption of Efficient and Sustainable Agricultural, Forestry and Other Resource Policies, Programs, Technologies and Practices that Protect, Sustain and Enhance Water, Soil and Air Resources
		Objective 4.3, 1997-2002 To Improve Decision Making on Public Policies Related to Agriculture and the Environment

In designing an evaluation system to meet the new PART and Budget and Performance Integration requirements, CSREES Office of the Administrator (Planning and Accountability) conducted an extensive review of the approaches used to assess federal research efforts and concluded that reviewing and evaluating the thousands of research grants funded in terms of portfolios was the most logical and fruitful approach. In addition, CSREES, unlike its sibling research agencies in USDA, has outreach education and higher education support components, adding considerably to its complexity. Not only are there thousands of grants focused on solving national problems, there are also three main programmatic areas. CSREES-sponsored research, education, and extension work is funded from multiple authorities and funding sources (CSREES has 57 Congressional funding lines). The use of portfolios to describe and evaluate CSREES work, therefore, is new and requires a broader, more integrated perspective than Deputy Administrators and NPLs have previously employed. These self-review papers are the first time that packages of Agency work have been conceived, described, and evaluated using a portfolio/ Knowledge Area component approach. Therefore, although some component program-oriented performance measures may be available, other, new portfolio and KA-focused measures may be new and not yet available for analysis. Initiatives are already underway to improve data availability for portfolio review.

Each Knowledge Area discussion is composed of research, education, and extension activities across various units within CSREES. A specific program, often conducted by a single program unit or even a single National Program Leader, may address several Knowledge Areas and several objectives of the CSREES Strategic Plan. Descriptions of these areas do not cover all the activities within a portfolio. Additional information can be found in the Evidentiary Material that will be available at the CSREES Portfolio External Panel meeting. The CSREES website (http://www.csrees.usda.gov) also contains information on any portfolio's programs.

CSREES-sponsored research, education and extension work is funded from multiple authorizations and funding sources. To fully appreciate this integrated, mission-focused work, portfolios of topically-linked issues are aligned with the five USDA Strategic Goals, and 14 CSREES Strategic Objectives. Each objective has one or more portfolios composed of related Knowledge Areas (KA) that fully integrate research, education and extension, regardless of authorization or funding line. The portfolios, and their related KA, demonstrate the complementary nature of research, education and extension that is integrated to solve national problems, and to ensure that the public investment is effective and efficient. This review format also allows for a more comprehensive application of the review criteria of relevance, quality and performance. A full description of the strategic goals, objectives, and portfolios, and the Knowledge Area Classification for Research, Education, and Extension are included in the Evidence Volume.

Portfolio Review Support Functions

The CSREES Office of the Administrator (P&A) designed the portfolio review process and guides a systematic, standardized, transparent review process across all portfolios and programs of the agency. In order to obtain OMB approval for these panels, we have designed a structured process for rating each portfolio. The Office of the Administrator (Planning and Accountability) provides facilitation of the effort to prepare documentation and to manage panels convened by the Administrator. Program staff (NPLs) and senior managers were asked to participate by:

- Recommending to the Administrator names of panelists of sufficient experience and breadth of view to allow them to assess large, complex portfolios of combined research, education, and extension work integrated to meet strategic objectives.
- Writing, in coordination with National Planning and Accountability Leaders (NPALs) who served as facilitators and with IPAs from partner universities, self-review papers

(i.e., this document) that thoroughly addressed the key issues/problems/needs that the portfolio and its component Knowledge areas addressed, the resources devoted (inputs), the activities (outputs), and results (outcomes), and the resulting relevance, quality, and performance of the portfolio.

- Preparing documentary evidence in coordination with NPAL facilitators to accompany and support the self review paper with evidence that best meets standards of evaluation science. The evidence and paper describe the accomplishments, needed work, and steps planned for the next five years until the next external review panel.
- Presenting a brief overview of the portfolio and address inquiries of panelists at the meeting hosted by the planning and accountability unit of the office of the administrator.
- Receiving and responding to the recommendations of the panel for ways the portfolio could best meet its objectives and goals, and thereby further the mission of the agency.
- Meeting annually between external panels to update the portfolio, address PREP recommendations, and review and rate the portfolio outcomes for annual submissions to OMB (in lieu of holding external panels every year).

The panel, hosted by the Office of the Administrator and staffed by P&A NPALs and the partner IPA who assisted NPLs in writing the self review paper, meets in Washington, D.C. for 2 ½ days. Support is provided in note taking, provision of further analyses or documentation, and the production of the draft panel report of recommendations. The panel reviews the draft report, revising and finalizing it on the final day of the meeting. The panel then also provides oral feedback to the Associate Administrator, Deputy Administrators, and NPLs as the last step of its meeting in Washington.

Expert Panel Functions

During the review process, the external Portfolio Review Expert Panel is asked to:

- Read this self-review report
- Peruse accompanying reference support evidentiary materials as desired when in Washington for the panel meeting
- Request additional support information as panelists deem necessary
- Hear a brief overview presentation on the portfolio by subject matter experts (Deputy Administrator and NPLs) on the first day of the panel meeting
- Participate in a question-and-answer opportunity for clarification of issues during the overview presentations
- Discuss the relevance, quality, and performance of the portfolio, based on the material presented, during the panel meeting
- Rate the portfolio on the OMB criteria using a scoring tool that will be provided
- Provide feedback to the CSREES Administrator and program managers on what achievements have been made, as well as recommendations for improvement in reaching portfolio goals.

How CSREES, in General, Meets the OMB Criteria of Relevance, Quality, and Performance

The main purpose of this self-review document is to prepare panelists for the portfolio review process in which experts will rate the relevance, quality, and performance of CSREES efforts to meet strategic objectives through complex, integrated research, education, and extension efforts.

The following explanation provides insights into how the Agency excels in each dimension of the three OMB criteria by the general structure of its work. Section IV of this report provides a portfolio-specific discussion of these dimensions.

Relevance

CSREES NPLs are the critical links to our partners and constituents (including researchers, educators, extension specialists, experiment stations, the processing and packaging industry, commodity organizations, consumer groups, advocacy organizations, advisory committees, review panels, national academies, scientific and professional societies, federal agencies, White House Office of Science and Technology Policy, and Congress). Feedback from these groups and individuals is obtained directly and indirectly for identifying and prioritizing the national needs to assure relevance of programs within each portfolio. (See Evidentiary Materials)

Both formal and informal procedures are used to obtain stakeholder input. These may include stakeholder workshops, symposia, technical reviews, peer panel recommendation, white papers, CSREES departmental review reports, presidential directives, interagency, strategic plans for research and development, regulatory policies impacting food quality and safety and industry plans and priorities. In addition, every Request for Applications (RFA) specifically seeks stakeholder input as per requirements of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7613(c)(2)). This section requires the Secretary to solicit and consider input on a current RFA from persons who conduct or use agricultural research, education and extension for use in formulating future RFAs for competitive programs. These processes and networks help the agency ensure the relevancy of programs relative to local, state, regional and national needs. Priorities are generated through aggregation of problems and issues identified at the local, state, and national level.

All the programs managed by CSREES use relevance and quality as criteria for pre-award evaluation of projects. Relevancy is established taking into consideration the industry and/or consumer needs and priorities. The quality is assessed based on the scientific merit, proposed procedure, and potential to succeed.

Criteria and indicators are used wherever available. According to the National Research Council (*Our Common Journey: A Transition toward Sustainability, 1999*), "Indicators are repeated observations of natural and social phenomena that represent systematic feedback. They generally provide quantitative measures of the economy, human well-being, and impacts of human activities on the natural world. The signals they produce sound alarms, define challenges, and measure progress . . . . Generally, indicators are most useful when obtained over many intervals of observation so that they illustrate trends and changes. Their calculation requires concerted efforts and financial investments by governments, firms, non-governmental organizations, and the scientific community."

The portfolios being reviewed are dynamic and change periodically to address emerging national needs consistent with cutting edge science. Program descriptions, program reports, and request for applications included in the Evidentiary Materials section of this document demonstrate the dynamic nature of the portfolios.

Scope

The scope of a portfolio is reflected in the funds invested, and the number of projects and programs involved. Most portfolio work encompasses the programs of state agricultural experiment stations (SAES), 1862, 1890, and 1994 land grant institutions, Hispanic-serving

institutions, other cooperating institutions, including state and private colleges and university; and USDA intramural agencies. These programs are closely linked to and complement the teaching and extension activities of the land-grant and other institutions. At the university level, research programs also are integral to graduate education, through which scientists are prepared to address future scientific challenges. CSREES uses a unique partnership of federal and non-federal, private and public sector and NGOs partners to address national issues. Coordination, joint planning and priority setting are accomplished through various national and regional mechanisms to ensure the efficient use of resources.

CSREES portfolios usually employ a creative combination of funding mechanisms, including formula funds, the NRI, and special grants. Other Federal agencies and states may invest as well. This demonstrates that leveraging of funds and sharing of resources is critical to maximizing outcomes.

CSREES Science and Education Resources Development (SERD) is leading USDA's commitment to human capital development. It is important to note that the funds reported (except for SERD's education programs) in this document represent investments on research activities and do not include extension activities. The agency is currently addressing this issue, including modification of the CRIS database so that education and extension activities will be readily accessible in the next 5 years.

The summaries presented are based on federal and state research activity as documented in USDA CRIS, land-grant university plans of work, and the USDA Science and Education Impact database (see http://www.csrees.usda.gov/newsroom/impacts/impacts.html).

Focus on critical needs

CSREES peer review of formula-funded research proposals and competitive grant proposals and similar review of state Cooperative Extension plans of work and annual reports ensure that programs and activities supported by CSREES funds focus on critical scientific issues. National planning activities and listening sessions help to guide state and regional level research, education and extension programming to contribute to meeting national needs. The competitive review process especially encourages innovative ideas that are likely to open new research approaches to enhancing agricultural and natural resources management. A proven mechanism for stimulating new scientific research, the process increases the likelihood that investigations addressing important, relevant topics using well-designed and well-organized experimental plans will be funded. Each year, panels of scientific peers meet to evaluate and recommend proposals based on scientific merit, investigator qualifications, and relevance of the proposed research to the mission and goals of USDA.

For this report, priorities are based on USDA CSREES Strategic Plan. In addition, priorities and emerging issues are identified through the broad network of relationships that Deputy Administrators and National Program leaders have established. A number of themes are outlined in the KA descriptions (Section III) that illustrate where CSREES is contributing to timely, relevant research directed at solving critical problems of national significance.

Identification of emerging issues

Setting priorities is an important means of facilitating the scientific and technological advances needed to meet the challenges facing U.S. agriculture and natural resources management. Congress sets the budgetary framework by providing funds to CSREES. Members of Congress also make recommendations for the scientific and programmatic administration through appropriation language and through their questions and comments during Congressional hearings.

Input into the priority-setting process is sought from a variety of customers and stakeholders. The Agricultural Research, Education, and Extension Reform Act of 1998 formally require that formula-funded projects reflect stakeholder priorities. The scientific community provides direction through the competitive grant proposals it submits each year as well as through the proposal evaluation and funding recommendations of individual peer-review panels.

Participation by NPLs in review panels for competitive programs, federal interagency working groups, and stakeholder listening sessions are important mechanisms for CSREES to identify emerging issues. NPLs also attend professional and scientific meetings to remain current on scientific trends that should be reflected in CSREES programs and in the coordination of priority setting with other federal agencies. The Administrator and National Program Leaders have established close working relationships and networks with various stakeholder partners including research, education and extension scientists and educators at the universities and colleges, other federal agencies, county agents and educators, advocacy organizations, professional societies, advisory groups, environmental groups and Congress. Through such meetings, NPLs learn of stakeholders' current priorities, and solicit comments and suggestions on ways that CSREES can assist in meeting their needs. Through these interactions, emerging issues are identified.

Integration of CSREES programs

Integration refers to the linkage of the several CSREES missions of research, education, and extension in programs and activities to produce products which reach a wide variety of audiences or stakeholders in appropriate formats. These products might otherwise be disjointed and more narrowly defined. Although CSREES is dedicated to integrated efforts in all its programming areas, there are some challenges to accomplishing this, caused chiefly by outside factors. For example, some legislative authorizations are so specifically defined that they preclude meaningful integration. Similarly, some CSREES stakeholders have interests which are similarly fixed on single purposes. Such situations require that NPLs must often take the initiative to stimulate and accomplish integration in otherwise focused program areas. While this has been somewhat problematic in the past, significant progress has been made. CSREES also has competitive grant programs that specifically require or encourage integrated programming. The NRI, for example, is now authorized to allocate up to 20 percent of its annual funding for integrated projects, and within it, certain programs are identified as been appropriate. Some programs can now allocate funds to projects that integrate research and education activities.

The long-term outcomes of the portfolio can best be achieved through strong research, education and extension programs that are integrated. While the portfolio presents a very complex system in terms of funding and integration of programs, there is a critical need to develop new models and delivery systems that are effective and performance-based. National Program Leaders serve as an integral mechanism to direct, apply and adopt applied, research-based knowledge in innovative ways. They should continue and enhance their leadership in the delivery of research-based knowledge through extension, outreach and information dissemination thereby strengthening the capacity of public and private policy-makers who make decisions.

Multidisciplinary balance

Both mission-linked research and fundamental research are supported by CSREES formula- and competitively-funded research. Mission-linked research targets specific problems, needs, or opportunities. Fundamental research involves the quest for new knowledge about important organisms, processes, systems, or products and opens new directions for mission-linked research. Mission-based and fundamental research is essential to the sustainability of agriculture. Review of formula-funded projects reveals that the vast majority typically combine both fundamental and basic approaches. Although single-investigator projects remain the norm, increasingly these

types of research are taking multidisciplinary and multi-investigator formats. Additionally, CSREES competitive grant programs are encouraging multidisciplinary research. Moreover, CSREES requires that 20 percent of the research formula funding that it provides to states be devoted to multi-state activities, which at least indirectly promotes multidisciplinary approaches. In turn, the regional agriculture experiment station systems use the funds to support multi-state research projects and committees. At any given time, several such projects have objectives related to the portfolio of interest and CSREES NPLs serve as advisors to them.

From the extension perspective, multidisciplinary approaches, and involvement of end-users in the conduct of research experiments are well established practices in many states. This is especially true for multi-state research projects, where producers and other end-users are integrally involved in the projects. Additionally, some of the competitively funded programs require integration of research, education and extension in all funded projects. Specific examples of integrated projects and their outcomes are discussed in the KAs of the portfolio.

Interdisciplinary integration
CSREES supports strong program and disciplinary linkages within the portfolio team, throughout the agency, and with other government agencies with similar mission responsibilities. A strong university-based research, education and extension system, linked to the various USDA agencies and federal departments, and the private sector, moves us toward an integrated, sustainable system of resource management.

Quality

Significance of research findings
At the Agency level, all federal funds are leveraged at least by a ratio of $2 of non-federal funds for every $1 of federal funding. This leveraging provides expanded fiscal resources to address programs that are partially funded by CSREES.

CSREES, through its partnership with universities, other federal and state agencies, and private organizations, is contributing to a bank of science-based knowledge through research, education and extension activities. Included in this report are examples of some of the thousands of CSREES-funded projects that are having significant positive impact on addressing portfolio issues.

Research activities are geared to the needs of CSREES' stakeholders and the science-based knowledge resulting from these activities is used by policy-decision makers and others, and the end result is the protection of the health and well-being of society.

Methodological Rigor
All proposals submitted to CSREES must undergo a rigorous review process at several levels. Competitively-funded projects are reviewed by an external peer panel of experts drawn from universities, other federal and state partners, and the private sector. Non-competitively funded proposals, including formula funds, are reviewed at the university level prior to submission to CSREES, where they are further reviewed by NPLs. NPLs ensure that the proposed projects are in keeping with the mission of the agency, fit the intent of the legislative acts, and have measurable potential outcomes and impacts. Proposals submitted for congressionally-directed funding are also reviewed by NPLs, who subsequently schedule site visits to monitor the progress of these projects. Similarly, NPLs serve as liaisons to all multi-state projects for reasons previously discussed.

Outputs and Outcomes
Outputs of CSREES-funded activities include but are not limited to publications, development of guidelines and guidebooks, training manuals, curricula and courses, trained scholars, new methodologies and techniques, models and management strategies for management of soil, air and water resources. These outputs then lead to short- medium- and long-term outcomes. CSREES-funded activities must demonstrate that they will result in measurable impacts, so that outcomes and impacts are integrally connected. Proposals submitted for funding are assessed for these criteria as a measure of quality. The result, when viewed nationally, is a diverse portfolio of programs with different goals and objectives, but which will eventually result in cleaner soil, air and water for all citizens. Several examples of outputs and outcomes are presented in this document and the quality of these outputs and outcomes are further illustrated in the examples of activities highlighted as success stories under the accomplishments.

Stakeholder input and assessment
Formula fund (Hatch, Evans-Allen, McIntire-Stennis and Smith Lever) are required by the1998 Agricultural Research, Education and Extension Reform Act (AREERA) to obtain stakeholder input every year and describe the process used to identify individuals or groups as stakeholders. Also each institution needs to describe how these inputs relate to Plans of Work, priority setting, immediate needs and long-term goals, guidance on monitoring, and proposed research activities.

CSREES and ARS, the USDA in-house research component, conducts a number of stakeholder listening sessions, nation-wide, in order assess program effectiveness, for program development, and to identify new and emerging issues, and program directions. National Program Leaders from both agencies participate in these listening sessions, thereby reducing redundancy of programs.

Alignment of portfolio with current science
All funded projects complement the CSREES portfolio goals. The outcomes and accomplishments of funded projects could not be achieved without application of modern and advanced science methodologies and techniques.

Performance

Assessment of the performance of the programs funded in this portfolio suggests that the programs are providing science-based knowledge and education to meet portfolio goals.

Portfolio productivity
Each Knowledge Area described demonstrates various research, education and extension accomplishments. Assessing the productivity of competitively funded programs, including education, is relatively straightforward, in that project directors are required to submit annual and termination reports. In addition, NPLs routinely schedule site visits to assess progress of projects that receive congressionally-directed funds. The assessment is more difficult, however, with formula programs, particularly extension, in that states in the past have exercised wide latitude in what they report in their Plans of Work (POW) and annual reports. The new electronic web-based reporting system now under construction will require reporting plans and outcomes via the logic model. Because CSREES contributes a small percentage of the funds in some states, State annual POW reports varied from state to state, with some filing a detailed and comprehensive report regardless of funding source, to those that report on only those programs that were "touched" by CSREES funding. The result is that at the national level, there is a very mixed and incomplete picture of the results that emerge from CSREES-funded programs.

Portfolio completeness
Programs in this portfolio meet their intended outcomes at the individual project level as well as at state and institution levels where guidelines and directions are provided to states through formula funds. Details are provided in the Knowledge Area discussions that demonstrate that accomplishments are being achieved. Timely reviews and feedback from NPL-directed project reviews ensure that proposed objectives are being addressed so that proposed objectives are aligned with potential outcomes and impacts.

Portfolio timeliness
Assessing the timeliness of the work in a portfolio is largely done by monitoring the submission of final reports or requests for renewal, extension, or budget carryover. These determinations are relatively easy to track for competitive grants and special grant projects that require submission of formal proposals, annual and termination reports. Assessing the timeliness of the work accomplished through formula programs, particularly extension programs, has inherent challenges. Research projects have discreet start and completion dates, but extension programs may have semi-discreet start and completion dates because of the nature of education, which is rarely "completed." For example, because there is continual turnover in the extension audiences, the "timeliness" criterion is harder to assess. What can be assessed, in place of timeliness, is extension program evolution. As issues change and new knowledge is gained, extension programs are continually evolving in order to incorporate new considerations. This is monitored, in part, through the state Annual Reports which are reviewed by National Program Leaders.

Agency guidance relevant to portfolio
The agency provides guidance (examples of the various forms of agency guidance are contained in the Evidentiary Materials) in the conduct and assessment of programs through several mechanisms:

- Requests for Applications - Project Directors of funded projects are expected to fulfill the project objectives and to submit annual progress and termination reports, which are logged into the CRIS database. The requirements that must be fulfilled by the Project Director are clearly spelled out in the Terms and Conditions of the award document that is sent to the performing institution. NPLs, if needed, are also available to provide timely answers to the Project Directors on an individual basis. In this way, CSREES ensures that funding recipients clearly understand their obligations.

- NPL Management and Leadership - NPLs are responsible for portfolios of work within specific disciplines, funding sources and functions. NPLs interact with multi-state research committees, ad hoc program committees, strategic planning efforts and other venues with the university community. Part of this interaction involves conveying agency needs and expectations regarding the funding that is being provided. This is usually more relevant to formula-funded programs, as competitive grant recipients have formal obligations to complete project objectives for which they were funded.

Portfolio accountability
The work accomplished in portfolios is monitored by NPLs who are either program directors for competitive grant programs, agency contacts for special grants, or state annual report reviewers. The CRIS system is an informational resource that allows NPLs to track the progress of research and, more recently, education programs. The CRIS database is accessed by NPLs to determine if projects were completed as funded, requests for extensions and budget carryovers are justified, and progress reports were submitted prior to approving requests for renewals. Extension formula-funded programs submitted as POW annual reports, are evaluated on a state-by-state basis by a two-member NPL Review Team. These reports are evaluated for completeness, evidence of

impacts, and stakeholder involvement. A written assessment is completed and returned to each institution. In the event that a report has deficiencies, the lead NPL communicates those deficiencies to the extension director, and awaits additional documentation before proceeding with the review. The review is completed upon receipt of a satisfactory report.

CSREES is in the process of designing new processes and tools, particularly monitoring and evaluation systems, and will train the agency's partners in their use. In an environment in which funding is becoming tighter, any activity that strengthen accountability and impacts will likely have greater funding support.

Background on CSREES and its Funding Authorities

This report was developed by the [add name of unit developing report], Cooperative State Research, Education, and Extension Service (CSREES), United States Department of Agriculture (USDA). It is submitted to the Portfolio Review Panel, which is convened by the CSREES Administrator, in order to assess the effectiveness of the [acronym for unit name] unit as it leads efforts to address national problems and/or issues related to [portfolio short subject description]. The report covers a wide variety of programs conducted from 19XX–20XX that are related to CSREES Strategic Goal X, and Objective X.X.

The first part of the report contains a general description of CSREES, its vision, mission, functions, and funding authorities. The second part is a description of the Knowledge Areas addressed in this portfolio. Knowledge Areas (KA) covered in this portfolio include:

- [inset list of KA numbers and titles]

Each Knowledge Area discussion is composed of research, education, and extension activities across various units within CSREES. A specific program, often conducted by a single program unit or even a single National Program Leader, may address several Knowledge Areas and several objectives of the CSREES Strategic Plan. Write-ups on these areas are compressed and do not cover all the activities within a portfolio. Additional information can be found in the Evidentiary Material that will be available at CSREES review. The CSREES website (http://www.csrees.usda.gov) also contains information on this portfolio's programs.

During the portfolio review meetings, National Program Leaders (NPL's) with responsibility for each Knowledge Area will provide the Panel with a brief presentation on the highlights of their Knowledge Area. They will then be available for clarification and discussion should the Panel have further questions. It is CSREES' expectation that Review Panel members will:

(1) Study this report before meeting in Washington, DC
(2) Ask the NPL's questions for clarifications during or after their presentations
(3) Assess and score the 1999-2003 portfolio on the basis of criteria developed by the Office of Management and Budget (OMB) for Relevance, Quality and Performance, using a scoring tool that will be provided
(4) **Make recommendations to the CSREES Administrator and NPLs for improving the portfolios' performance**

United States Department of Agriculture

The mission of USDA is to provide leadership on food, agriculture, natural resources and related issues based on sound public policy, the best available science and efficient management.

USDA=s vision is to be recognized as a dynamic organization that is able to efficiently provide the integrated program delivery needed to lead a rapidly evolving food and agriculture system.

Cooperative State Research, Education, and Extension Service

The Cooperative State Research, Education and Extension Service (CSREES) role is to generate and disseminate knowledge via extramural research and education in support of the USDA mission. CSREES is USDA=s primary link with the land-grant university system and with other higher education institutions. CSREES invests public funds, as authorized and appropriated by the Congress, in basic, applied, and developmental research, extension, and teaching activities in food and fiber, agriculture, renewable natural resources, forestry, and the physical and social sciences. Through the distribution and management of formula funds, competitive grants, and special grants, CSREES achieves its mission to advance knowledge for agriculture, the environment, human health and well being, and communities. Specifically, CSREES provides national program leadership to identify, develop, and manage programs to support land grant university-based and other institutional research, education, and extension, and provides fair, effective, and efficient administration of federal assistance implementing research, education and extension awards and agreements. Chart 2 provides an overview of the structure of the agency offices and units.

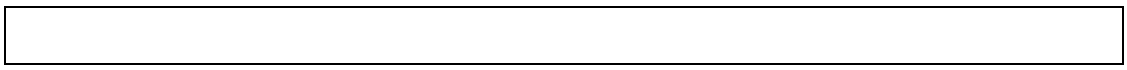
Vision
Agriculture is a knowledge-based, global enterprise, sustained by the innovation of scientists and educators.

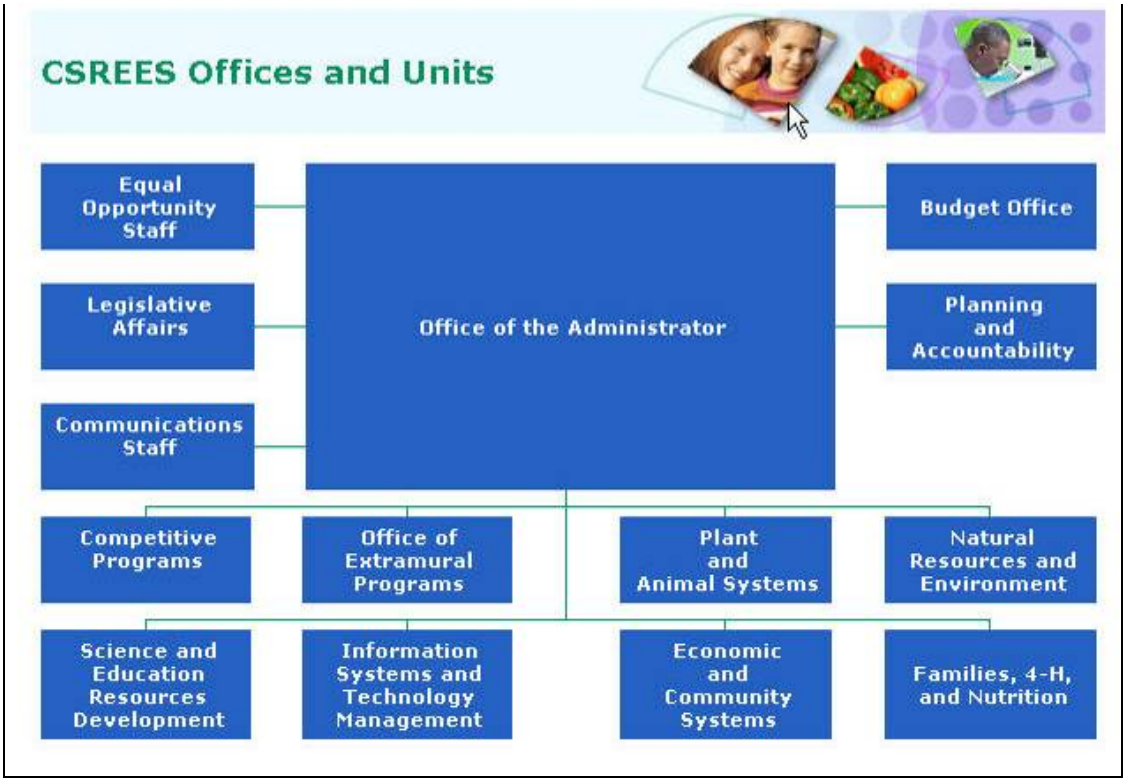
Mission
To advance knowledge for agriculture, the environment, human health and well being, and communities.

Functions
Program leadership to identify, develop, and manage programs that support university-based and other institutional research, education, and extension. Fair, effective, and efficient administration of federal assistance in implementing research, education, and extension awards and agreements.

(See evidentiary material for the CSREES Strategic Plan)

Chart 2: Organizational Structure of CSREES





Using Portfolios and Knowledge Areas to Address Issues

CSREES-sponsored research, education and extension work is funded from multiple authorizations and funding sources. To fully appreciate this integrated, mission-focused work, portfolios of topically-linked issues are aligned with the 5 USDA Strategic Goals, and 14 CSREES Strategic Objectives. Each objective has one or more portfolios composed of related Knowledge Areas (KAs) that fully integrate research, education and extension, regardless of authorization or funding line. The portfolios, and their related KA, demonstrate the complementary nature of research, education and extension that is integrated to solve national problems, and to ensure that the public investment is effective and efficient. This review format also allows for a more comprehensive application of the review criteria of relevance, quality and performance. A full description of the strategic goals, objectives, and portfolios, and the Knowledge Area Classification for Research, Education, and Extension are included in the Evidence Volume.

CSREES Reviews of [insert name of program]

One of the other educational efforts that CSREES engages in is reviewing various college/department/school plant and animal related programs at land grant institutions. When program review requests are submitted to the agency by land grant university partners, CSREES Deputy Administrators assign the appropriate NPL to lead the review team, which generally is comprised of faculty from other institutions and USDA personnel who have expertise in the program that is slated for review. The review encompasses research, education (undergraduate and graduate programs) and extension activities as they relate to the particular program. The review team reviews a self study document prepared by the institution and typically spends

approximately four days on site interviewing and listening to presentations by administrators, faculty, staff, students, and stakeholders. The review team subsequently prepares a comprehensive report that documents the strengths and weaknesses of the programs and also identifies opportunities for improving the program. This process allows the agency to gain a better insight into and to influence research, education and extension programs at land grant institutions. The institutions also gain from having their programs reviewed from a national perspective so that their programs are consistent with those of their peers. Program reviews conducted during FY1999-2003 are shown in the Knowledge Area descriptions in Section III.

The Role and Authority of a National Program Leader

National Program Leaders (NPLs) and other program managers in CSREES are empowered to carry out the mission of CSREES - to advance knowledge for agriculture, the environment, human health and well-being, and communities. To accomplish this mission, these senior staff members perform critical tasks under the authority of the CSREES Administrator and report to CSREES Deputy Administrators. These tasks fall into four general categories:

- Network and collaborate with partners and stakeholders to identify mission-relevant problems, opportunities, and issues requiring Federal attention and support
- Conceive, formulate, and direct programs and activities to respond to existing or emerging problems, opportunities, and issues through the development and application of science-based knowledge
- Administer and manage programs and activities to develop and apply science and knowledge
- Evaluate and assess the quality, outcomes, and impacts of these programs

Chart 3 provides an overview of responsibilities under various types of funding.

Chart 3: National Program Leaders Activities in CSREES Program Categories

Program Category	Examples of Program Leadership
Formula Funding	
Formula Research*	National program planning & oversight, multi-state/multi-discipline coordination & facilitation, national priority setting, national symposia, project review
Formula (Smith Lever) Extension	National program planning & oversight, multi-state/multi-discipline coordination & facilitation, national priority setting, national symposia, plans of work review
Special Grants	
Special Grants - research	Overall programmatic oversight, grant management, national/regional coordination
Other Research	Overall programmatic oversight, grant management, national/regional coordination
Smith-Lever 3(d) Extension	Overall programmatic oversight, grant management, national/regional coordination
Other Extension	Overall programmatic oversight, grant management, national/regional coordination
Competitive Grants	
National Research Initiative	RFA development, panel management, national priority setting, national symposia
Integrated Activities (406)**	RFA development, panel management, national priority setting, national symposia, grant management
Higher Education	RFA development, panel management, national priority setting, national symposia, grant management
* Includes Hatch Act, McIntire-Stennis Cooperative Forestry, Evans-Allen Program, and Animal Health and Disease Section 1433. ** Includes water quality, food safety, and pest management programs.	

National Planning and Accountability Leaders (NPALs) in the Planning and Accountability Unit of the Office of the Administrator focus specifically on strategic planning for the Agency and on conducting and guiding evaluations of the portfolios and their program components. NPALs host and staff the Portfolio Review Expert Panels (PREPs), facilitate the writing of self-review papers, write the Agency PART, provide accountability support for the BPI and budget justifications, obtain POW/Annual Report data, coordinate with IT on databases, and serve Agency Partners as well.

Current Trends and Opportunities

The land-grant university system was established by the Morrill Act of 1862 "to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." At that time, the scientific basis of agriculture was rudimentary and focused primarily on increasing agricultural productivity. Plant and animal breeding, nutrient management and

mechanization of agriculture are significant milestones in the spectrum of scientific investment in agricultural productivity.

As agriculture matured and became more fully integrated into the social, political and economic structure of the nation, broader issues, including positive and negative environmental and economic externalities, access to and the distribution of the benefits of public investment in agriculture and rural communities, and the sustainability of the scientific workforce have emerged. Breakthroughs in fundamental science, including genomics, microbiology and nanotechnology have raised the bar for the application of science, technology, and practice in producing, processing, marketing and distributing food and fiber products. These sometimes produced additional questions regarding long term risks and benefits, ethics, and domestic and international consumer acceptance. In the post-9/11 environment, the aggregate safety and security of the food and fiber supply, terrorism aimed at food and fiber products, and protecting public health and well being become paramount.

In order for U.S. agriculture to compete in today's global market, a number of production, economic, and policy issues must be addressed by the research, education, and extension. Continued advances in biotechnology, precision farming, disease epidemiology, and animal and human nutrition will improve agricultural production efficiency and the quality of agricultural products. The complexity of public policy decisions, as influenced by divergent societal values, economic forces, changing demographics and natural resource sustainability, will be addressed by consensus-building forums. The development of new food and nonfood products such as fuel, paint, plastics, pharmaceuticals and nutraceuticals from agricultural or other bio-based materials will expand the market for agricultural commodities. Some have the potential to minimize our dependence on foreign oil. Better understanding of global markets and improved business and marketing practices can help firms be more successful. Domestic and international policy analysis will identify existing policies that are impediments to trade and development, and lead to alternatives.

"The Partnership," Stakeholders, and Customers

Integral to the CSREES mission, and its ability to carry on that mission, is the notion of partnerships. CSREES is the federal partner in a vast network of thousands of scientists, educators, and extension staff and volunteers, who carry out its programs throughout the United States and its territories, and beyond. Most of these partners work at or through land-grant universities. This special relationship is known as "The Partnership". There are one or more land-grant institutions in each U.S. state and territory and in the District of Columbia. These partnerships demonstrate the linkages and interdependency between the federal and state components of a broad-based, national agricultural research, extension, and higher education system.

Starting in 1862, the federal government granted federally owned land (hence the name "land-grant") to each state for the development of a university that would serve the citizens of the state in the areas of research, education and extension. Other land-grant universities were designated in 1890 (historically black universities and land-grant colleges) and in 1994 (American Indian/Alaska Native tribal colleges). In 1996 USDA also began partnering with Hispanic-serving institutions to provide support for a growing Hispanic population in the US.

While nearly all universities have research and education as their core responsibilities, land-grant universities also have a federal government-mandated extension (outreach) responsibility. "Extension" is defined as "non-formal adult and youth education programs that translate and

transfer research findings that can be applied to real-life situations." This means they are directed by law to offer to the public noncredit, tax-supported educational programs and information based on the results of university research. The role of the university system is critical to assure relevancy, quality, and performance for the programs administered and led by the agency. CSREES program leadership serves as both the catalyst and focal point for national research, extension and education programs dealing with agriculture, the environment, human health and well-being, and communities. The wide-ranging CSREES land-grant partnership includes:

- More than 130 colleges of agriculture
- 59 agriculture and natural resource experiment stations
- 57 cooperative extension services
- 65 McIntire-Stennis Cooperative Forestry Research institutions
- 20 historically black colleges and universities
- 27 colleges of veterinary medicine
- 42 schools and colleges of family and consumer sciences
- 33 Native American land-grant institutions
- 17 Alaskan native-serving and Hawaiian native-serving institutions
- More than 240 Hispanic-serving institutions

The scope of partner activities is broad. They include: all aspects of agriculture; natural resource conservation and environmental quality; plant and animal production, protection, and health; processing, distribution, safety, marketing, and utilization of food and agricultural products; forestry (including urban and agroforestry), fisheries, wildlife and range sciences; aquaculture; family and consumer sciences; human nutrition; rural, community, and economic development; sustainable agriculture; molecular biology; and biotechnology.

CSREES' ultimate customers are citizens. CSREES works with land-grant, other institutions and industry to create and transfer the know-how and the technology from the laboratory to farmers, ranchers, consumers, and agribusiness. The Cooperative Extension System, through state and county extension offices, provides information to every county in the nation, offering extension education that links research, science and technology to people where they live and work. Topics range from community development, health care, food safety, water quality, sustainable agriculture, and the environment to programs for children, youth, and families.

The main extramural research and education partnership for CSREES exists with the Land Grant universities. Funding from CSREES supports research, extension, and education programs at these institutions. Where the funding is provided based on a formula-based allocation, CSREES does not dictate specific program goals and objectives, but relies on NPLs to convey the mission and goals and objectives of the Agency and relies on the original authorizing legislation to reflect that mission. This allows stakeholders at the state and local levels to determine their greatest research and extension needs, thereby solving national problems at the local and regional level. Where funding is provided through competitive grants announced via the Requests for Applications (RFAs) written by NPLs who focus work to meet Agency goals, institutions are required to pursue the program of work which they proposed and for which they received funding.

Funding Authorities for CSREES Activities

CSREES programs increase and provide access to scientific knowledge; strengthen the capabilities of land-grant and other institutions in research, extension and higher education; increase access to and use of improved communication and network systems; and promote informed decision making by producers, families, communities, and other customers. CSREES supports research, education and extension at partner institutions mainly through three funding mechanisms: 1) formula funds, 2) competitive grants and 3) special grants.

- **Formula Funds**
  CSREES provides funds for research and extension to land grant institutions (1862, 1890 and 1994 institutions) and schools of forestry and veterinary medicine through several formula grant authorities. The amount of funds provided to each institution is determined through a statutory formula which may include such things as the rural population or amount of farmed acreage in a state. Formula funds are a critical source for base support for agricultural programs at the land-grant institutions. Combined with matching funds from state and local governments, these funds form the foundation for activities ranging from animal and crop improvement, watershed management, 4-H programs and nutrition education. Decisions about how the funds are spent are determined on a local and regional basis. Institutions receiving Hatch and Smith-Lever formula funds and the 1890 Institutions receiving research and extension formula funds must submit five-year plans of work describing the use of the funds and must document the process used to solicit stakeholder input used to set priorities for the use of Federal research and extension funds.

- **Competitive Grants**
  Competitive programs enable CSREES to attract a large pool of applicants to work on agricultural issues of national interest, and to select the highest quality proposals submitted by the most qualified individuals. CSREES uses the competitive grant processes for fundamental or applied research, for extension, for higher education, and for programs which integrate research, education and extension functions. Grants are awarded through a rigorous peer-review process. Eligibility, administrative rules, and procedures may vary for each program depending on authority derived from the Farm Bill or appropriation law. Special competitive programs are available that are tailored to increase participation of minority or small and midsized institutions in research, education or extension. Other competitive grants are more broadly open to all applicants or to specific types of applicant institutions. The number of competitive programs administered by CSREES has increased in recent fiscal years with the addition of the Integrated Research, Education and Extension Grant Programs.

- **Special Grants** (Congressionally-directed projects)
  Earmarked projects are those defined specifically by Congress to support a designated institution or set of institutions for particular topics in research, education or extension. Earmarks serve the purpose of directing funds to local or state issues that are of high specificity to the locality. These grants, numbering in the several dozen and not a component of the Administration's overall agenda, will not be discussed further in this document.

In this section each type of funding is profiled along with the legislation that established the authorization and funding. It is important to note that while these funding allocations are listed

under discrete headings (e.g. Research and Education Activities, Integrated Activities, Extension Activities, etc.) there are instances where the enabling legislation allows for a variety of program implementation scenarios. For example, under both Hatch and Smith-Lever there are multi-state projects that are similarly constructed to integrated efforts. The Sustainable Agriculture Research and Education program also provides funding for projects that combine research, extension and education.

Research and Education Activities

Research and Education programs administered by CSREES are USDA's principal connection to the land grant university system of the U.S. for the purpose of conducting agricultural research and education programs. USDA participates with state and other cooperators to encourage and assist the state institutions in the conduct of agricultural research and education through the State Agricultural Experiment Stations (SAES) of the 50 states and the territories; by approved Schools of Forestry; the 1890 Land-Grant Institutions, Tuskegee University and West Virginia State College; Colleges of Veterinary Medicine; and other eligible institutions. Appropriations for research and education activities are authorized under the following Acts.

Formula Programs

Hatch Act

The foundation of the Federal-State partnership in agricultural research is financed through formula Hatch Act funding and matching State revenue. The Hatch Act was enacted in 1887 and has been amended numerous times since then. The Hatch Act allocates federal funds on a formula basis to the State Agricultural Experiment Stations of the 50 States, District of Columbia, Puerto Rico, Guam, Virgin Islands, Micronesia, American Samoa, and Northern Mariana Islands for research to promote a sound and prosperous agriculture and rural life. One hundred percent matching by state funds is required. Hatch funding supports sustained research activities in agricultural priority areas to address pre-commercial and/or non-funded technologies of public need. Hatch-funded research is complementary to ARS National Research Programs and State-based research, addressing technology gaps through coordinated programs. The States are required to use no less than 25 percent of Hatch funds for multi-state research projects. These projects are supported through regional committees which address critical and emerging issues in agricultural research.

McIntire-Stennis Cooperative Forestry

The Cooperative Forestry Research Act of October 10, 1962 established McIntire-Stennis funding. The Act authorizes funding of research in State institutions certified by a State representative designated by the governor of each State. The Act provides that appropriated funds be apportioned among States as determined by the Secretary after consultation with the legislatively mandated Forestry Research Advisory Council. The Council consists of 16-20 members representing Federal and State agencies concerned with developing and utilizing the Nation's forest resources, the forest industries, the forestry schools of the State-certified McIntire-Stennis eligible institutions, SAES, and volunteer public groups concerned with forests and related natural resources. Determination of apportionments follows consideration of pertinent factors including areas of non-federal commercial forest land, volume of timber cut from growing stock, and the non-Federal dollars expended on forestry research in the State. The Act also provides that payments must be matched by funds made available and budgeted from non-Federal sources by the certified institutions for expenditure on forestry research. Three percent of funds appropriated under this Act are set-aside for Federal administration.

Evans-Allen Program *(1890 Colleges, Tuskegee University, and West Virginia State College)*
The Evans-Allen program was established by the National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1445. This program allocates funds on a formula basis for agricultural research at the 1890 Institutions, Tuskegee University and West Virginia State College. The agricultural research programs at the 1890 Land-Grant Colleges and Universities are designed to generate new knowledge which will assist rural underprivileged people and small farmers obtain a higher standard of living. Therefore, there is a high concentration of research effort in the areas of small farms, sustainable agriculture, rural economic development, human nutrition, rural health, and youth and elderly. The 2002 Farm Security and Rural Investment Act requires a 100% match of federal dollars. The Secretary may waive the match above 50% if an institution is incapable of meeting that requirement.

Animal Health and Disease Program
The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1433 provides for support of livestock and poultry disease research in accredited schools or colleges of veterinary medicine or SAES that conduct animal health and disease research. These funds provide support for new research initiatives and enhance research capacity leading to improved animal health, reduced use of antibacterial drugs and improved safety of foods of animal origin.

The funds are allocated on a formula basis in support of livestock and poultry disease research at accredited schools or colleges of veterinary medicine or State Agricultural Experiment Stations that conduct animal health disease research. Matching is required.

National Research Initiative Competitive Grants (NRI)

Section 2(b), Act of August 4, 1965, 7 U.S.C. 450i(b), as amended, authorizes Competitive Research Grants for periods not to exceed five years to SAES, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals to further the programs of the Department. The NRI supports research, education, and extension grants that address key problems of national, regional, and multi-state importance in sustaining all components of agriculture (farming, ranching, forestry including urban and agro-forestry, aquaculture, rural communities, human nutrition, processing and others). Such integrated projects hold the greatest potential to produce and transfer knowledge directly to end users.

Providing this support requires that NRI advance fundamental sciences in support of agriculture and coordinate opportunities to build on these discoveries through new efforts in education and extension that deliver science-based knowledge to people, allowing them to make informed, practical decisions. Accordingly, the NRI supports fundamental research, mission-linked research, and integrated research, education, and extension projects. These programs build on a foundation of ongoing research addressing key issues of national and regional importance to agriculture, forestry, human nutrition and related sciences.

The authority to support integrated projects is contained in Section 733 of the General Provisions of the Consolidated Appropriations Act, 2004 (Pub. L. 108-199), which provided CSREES with the authority to use up to twenty percent of the amount made available in the Act for the NRI, to carry out a competitive grants program under the same terms and conditions as those provided in Section 401 of the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA) (7 U.S.C. 7621).

It should be noted that within CSREES, integrated multi-functional projects are supported primarily through two competitive grants programs, the National Research Initiative (NRI) competitive grants program described in this section and the Integrated Research, Education, and Extension (from Section 406 of AREERA, described below under Integrated Activities) competitive grants program.

Special Research Grants

Section 2(c), Act of August 4, 1965, 7 U.S.C. 450i (c), as amended, authorizes Special Research Grants for periods not to exceed three years to SAES, all colleges and universities, other research institutions and organizations, federal agencies, private organizations or corporations, and individuals. Previously, grants were made available for the purpose of conducting research to facilitate or expand promising breakthroughs in areas of the food and agricultural sciences. However, the Agricultural Research, Extension, and Education Reform Act of 1998 expanded the purposes under this authority to include extension or education activities. Grants funded in this account are only for research projects. Special Research Grants are awarded on a discretionary basis as well as through the use of competitive scientific peer and merit review processes. These grants, numbering in the hundreds, will not be discussed further in this document.

Other Research

Critical Agricultural Materials
A program of research, technology development, and technology transfer was authorized for the development of critical agricultural materials from native agricultural crops having strategic and industrial importance.

Aquaculture Centers
Authorizes the establishment of aquacultural research, development and demonstration centers in the United States for the performance of aquaculture research and extension work and demonstration projects. Funding currently supports five regional aquaculture centers, as designated by Congress.

Sustainable Agriculture Research and Education Program (SARE)
Authorizes a program to facilitate and increase scientific investigation and education in order to reduce the use of chemical pesticides, fertilizers, and toxic natural materials in agricultural production; improve low-input farm management; take advantage of the experiences and expertise of farmers and ranchers through their direct participation and leadership in projects; and transfer reliable and timely information to farmers and ranchers. Grants are awarded on a regional basis by panels which include producers as well as scientific experts. (See also SARE in Extension below)

Supplemental and Alternative Crops
A research and pilot project program was authorized for the development of supplemental and alternative crops. The program has been directed to support the development of canola, hesperole and other natural products from desert plants.

1994 Institution Research Grants
The Equity in Educational Land-Grant Status Act of 1994, Public Law 103-382, as amended, authorizes a competitive grants program for the 30 institutions designated as 1994 institutions. Section 7201 of the Farm Security and Rural Investment Act of 2002 adds a new institution, increasing the number of recipients eligible to receive funding under this program to 31. The

program allows scientists at the 1994 institutions to participate in agricultural research activities that address tribal, National, and multi-state priorities.

Federal Administration (direct appropriation)
Authority for direct appropriations is provided in the annual Agriculture, Rural Development, Food and Drug Administration and Related Agencies Appropriation Act. These funds are used to provide support services in connection with planning and coordination of all research and education programs administered by CSREES, including the Research, Education, and Economics Data Information System.

Small Business Innovation Research Program
Authorizes the award of competitive grants to science-based small business firms for the support of research dealing with Forests and Related Resources; Plant Production and Protection; Animal and Wildlife Production and Protection; Air, Water and Soils; Food Science and Nutrition; Rural and Community Development; Aquaculture; Industrial Applications; and Marketing and Trade. The program is funded through a statutory mandatory assessment of 2.5 percent on all USDA externally supported research and is managed by CSREES.

Biotechnology Risk Assessment Research Competitive Grant Program
This program was authorized by the 1990 Farm Bill and funds research in support of biotechnology research and regulation related to environmental risk assessment. The program is funded through a 2 percent assessment on USDA-supported biotechnology research.

Higher Education

CSREES' Science and Education Resources Development (SERD) is leading USDA's commitment to human capital development. SERD's grant programs strengthen agricultural and science literacy in K-12 education, influence students' career choices toward agriculture, strengthen higher education in the food and agricultural sciences, prepare graduate students, and train master's and doctoral-level students as future scientists. SERD also provides national leadership for revitalizing curricula, recruiting and retaining new faculty, expanding faculty competencies, using new technologies to improve instruction delivery, attracting outside scholars, developing research and teaching capacity at minority-serving institutions, and increasing the diversity of the food and agricultural scientific work force. The following grant programs support our efforts.

Graduate Fellowship Grants
The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1417(b)(6), Higher Education-Graduate Fellowship Grants are awarded on a competitive basis to colleges and universities to conduct graduate training programs to stimulate the development of food and agricultural scientific expertise in targeted national need areas. This program strengthens higher education in the food and agricultural sciences by producing graduates capable of fulfilling the Nation's requirements for professional and scientific expertise. Doctoral students are recruited and supported for three years of training in targeted specializations characterized by shortages of expertise.

Institution Challenge Grants
Pursuant to Section 1417(b)(1), initiated in FY 1990, stimulates and enables colleges and universities to provide the quality of education necessary to produce baccalaureate or doctor of veterinary medicine graduates capable of strengthening the nation's food and agricultural

professional work force. It is intended that projects supported under this program will 1) address a State, regional, national, or international educational need, 2) involve a creative or nontraditional approach toward addressing that need which can serve as a model to others, 3) encourage and facilitate better working relationships in the university science and education community, as well as between universities and the private sector, to enhance program quality and supplement available resources, and 4) result in benefits which will likely transcend the project duration and USDA support. U.S. colleges and universities that offer a baccalaureate or first professional degree in at least one discipline or area of the food and agricultural sciences may submit proposals. All Federal funds competitively awarded under this program must be matched by the universities on a dollar-for-dollar basis from non-federal sources.

1890 Institution Capacity Building Grants
Initiated in 1990, under 1417(b)(4), this program was established to build the institutional capacities of the 1890 historically black land grant colleges and Tuskegee University through cooperative linkages with Federal and non-Federal entities. This program is designed to strengthen institutional teaching and research capacities, through cooperative programs with Federal and non-Federal entities, including curriculum, faculty, scientific instrumentation, instruction delivery systems, student experimental learning, student recruitment and retention, studies and experimentation, centralized research support systems, and technology delivery systems, to respond to identified State, regional, national, or international educational needs in the food and agricultural sciences, or rural economic, community, and business development. Matching is encouraged.

Multicultural Scholars
Competitively awarded grants program open to colleges and universities for undergraduate multicultural four-year scholarships to meet national needs for training food and agricultural scientists and professionals. Multicultural eligibility is specifically defined as African-Americans, Hispanics, Asians or Pacific Islanders, and Native Americans or Alaskan Natives. Matching funds are required.

Hispanic-Serving Institutions Education Grants Program
The competitive Hispanic Education Partnership Grants Program, established under Section 1455(a), is intended to promote and strengthen the ability of Hispanic-Serving Institutions (HSI) to carry out higher education teaching programs in the food and agricultural sciences. (HSI designation requires an undergraduate Hispanic enrollment of at least 25 percent.) About 240 such institutions are eligible to compete. Funded projects address one or more targeted need areas: curricula design and materials development; faculty preparation and enhancement for teaching; instruction delivery systems; scientific instrumentation for teaching; student experiential learning; and student recruitment and retention.

Tribal Colleges Education Equity Grants Program
The Equity in Educational Land-Grant Status Act of 1994, Public Law 103-382, as amended, launched in 1996 a formula-based effort to enhance educational opportunities for Native Americans by strengthening instructional programs in the food and agricultural sciences at the 31 tribally controlled colleges designated as the 1994 Land-Grant Institutions. Section 7202 of the Farm Security and Rural Investment Act of 2002 increases the authorized amount from $50,000 to $100,000 per institution. Funds may be used to support teaching programs in the food and agricultural sciences in the targeted need areas of curricula design and instructional materials development; faculty development and preparation for teaching; instruction delivery systems; student experiential learning; equipment and instrumentation for teaching; and student recruitment and retention. These institutions serve approximately 14,000 Native American

students. Projects focus on undergraduate and graduate studies in the food and agricultural sciences.

Tribal Colleges Endowment Fund
This program, authorized by Public Law 103-382 and launched in 1996, distributes interest earned by an endowment established for the 1994 Land-Grant Institutions (31 Tribally-controlled colleges) as authorized in the Equity in Education Land-Grant Status Act of 1994. The Endowment Fund enhances education in agricultural sciences and related areas for Native Americans by building educational capacity at these institutions in the areas of curricula design and materials development, faculty development and preparation for teaching, instruction delivery systems, experiential learning, equipment and instrumentation for teaching, and student recruitment and retention. At the end of each fiscal year, the Secretary withdraws the earned interest income from the endowment fund for the fiscal year, and after subtracting administrative costs, CSREES distributes the adjusted income as follows: 60 percent of the adjusted income from these funds is distributed among the 1994 Land-Grant Institutions on a pro rata basis, the proportionate share being based on the Indian Student Count, and 40 percent of the adjusted income is distributed in equal shares to the 1994 Land-Grant Institutions.

Secondary/2-Year Post Secondary
The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1417(j), as amended, established the Secondary and Two-year Postsecondary Agriculture Education Challenge Grants program. It is designed to promote and strengthen secondary education in agribusiness and agri-science and to increase the number and/or diversity of young Americans pursuing college degrees in the food and agricultural sciences. The intent of the program is to encourage teachers to creatively incorporate elements of agri-science and agribusiness into secondary education programs. Matching required.

Alaska Native-Serving and Native Hawaiian-Serving Institutions
Authorized by Section 759 of Public Law 106-78, this program was authorized to build educational capacity within the Native Alaskan and Native Hawaiian serving institutions. The intent of the legislation is to assist these institutions to carry out higher education teaching programs in the food and agricultural sciences.

Outreach and Assistance for Disadvantaged Farmers Activities

Section 2501 Legislative Authority

Outreach and Technical Assistance for Socially Disadvantaged Farmers and Ranchers Program

The authority for this program is contained in Section 2501(e) of the Food, Agriculture, Conservation, and Trade Act of 1990.

This program provides outreach and technical assistance to encourage and assist socially disadvantaged farmers and ranchers to own and operate farms and ranches and to participate in agricultural programs. CSREES assumed the responsibility for the grant making aspects of this program beginning in FY2003. Competitive grant awards are made for multiple year projects.

Integrated Activities

Competitive grant programs offering support for integrated research, education, and extension activities are uniquely positioned to effectively develop and implement solutions to important agricultural problems. They do this by funding applied research on specific problems and issues, and transferring the resulting knowledge to end users via classroom education or informal extension and outreach. Within CSREES, integrated multi-functional projects are supported primarily through two competitive grants programs, the Integrated Research, Education, and Extension (from Section 406 of AREERA, see below) competitive grants program, and the National Research Initiative (NRI) competitive grants program.

Section 406 Legislation Authority
The 406 program is authorized in Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185. Colleges and universities (as defined by section 1404 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977) as well as 1994 land-grant universities (via Section 7206 of the Farm Security and Rural Investment Act of 2002) are eligible to apply for these funds. The following seven programs are currently funded under this authority:

- ***Water Quality***
  The purpose of this program is to improve the quality of our Nation's surface water and groundwater resources through integrated research, education and extension activities.

- ***Regional Pest Management Centers***
  These centers are the focal point for team building efforts, communication networks, and stakeholder participation within a given region to address a range of pest management issues confronting farmers and other pest managers.

- ***Crops at Risk from the Food Quality Protection Act Implementation***
  The goal of the program is to develop new multiple-tactic IPM strategies to assist in the transition period for cropping systems affected by the implementation of the Food Quality Protection Act of 1996 - Food Quality Protection Act Risk Management Program for Major Food Crop Systems.

- ***Food Quality Protection Act Risk Mitigation Program for Major Food Crop Systems***
  This program emphasizes development and implementation of new and innovative pest management systems designed to maintain the productivity and profitability of major acreage crops while meeting or exceeding environmental quality and human health standards of the Food Quality Protection Act of 1996.

- ***Methyl Bromide Transition Program***
  This program is designed to support the discovery and implementation of practical pest management alternatives for commodities affected by the methyl bromide phase-out.

- ***Organic Transition Program***
  This program supports the development and implementation of biologically based pest management practices that mitigate the ecological, agronomic and economic risks associated with a transition from conventional to organic agricultural production systems.

- ***Food Safety***
  The National Integrated Food Safety Initiative (NIFSI) is primarily a food safety program, but a portion of this program addresses processing technologies for reduction and elimination of food-borne pathogens and allergens. Under Integrated Authority (Section 406), CSREES administers competitive grants in food safety activities that integrate research, education, and extension in priority areas that are based on stakeholder input. The food science and technology component addresses the impact of alternative technologies on food safety.

Other Legislative Authorities

The following two programs are authorized as Special Grants in Section 2(c), Act of August 4, 1965, 7 U.S.C. 450i (c), as amended, and Public Law 105-185.

- ***Critical Issues***
  This program supports the development of early prevention strategies to prevent, manage or eradicate new and emerging diseases, both plant and animal, which would prevent loss of revenue to growers and producers. These funds are provided under competitive awards.

- ***Regional Rural Development Centers***
  This program provides funds at four regional centers in Pennsylvania, Mississippi, Utah, and Iowa. Programs are designed to improve the social and economic well-being of rural communities in their respective regions. These funds are distributed according to the extent of the problem that requires attention in each region.

The National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3101 et seq.), provides authority for the following two programs:

- ***International Science and Education Grants Program***
  The International Science and Education Grants Program supports research, extension, and teaching activities that will enhance the capabilities of American colleges and universities to conduct international collaborative research, extension and teaching. ISE projects are expected to enhance the international content of curricula; ensure that faculty work beyond the U.S. and bring lessons learned back home; promote international research partnerships; enhance the use and application of foreign technologies in the U.S.; and strengthen the role that colleges and universities play in maintaining U.S. competitiveness. This is a competitive program.

- ***Homeland Security Program***
  This program provides support for a unified network of public agricultural institutions to identify and respond to high risk biological pathogens in the food and agricultural system. The network will be used to increase the ability to protect the nation by identifying, containing, and minimizing disease threats.

Other Programs

Community Food Projects

This program is funded through the Food Stamp Act and competitively awards grants to support the development of Community Food Projects with a one-time infusion of Federal dollars to make such projects self-sustaining or to support stand-alone technical and technical assistance activities. Community Food Projects are designed to meet the food needs of low-income people, increase the self-reliance of communities in providing for their own food need; and promote comprehensive responses to local food, farm and nutrition issues.

Organic Research and Extension Initiative
The Farm Security and Rural Investment Act of 2002 established this program with $3 million per year for Fiscal Years 2004-2008 to fund organic farming and marketing research. These funds are disbursed through a competitive grants program. The purpose of the program is to fund research that will enhance organic producers' and processors' abilities to grow and market high-quality organic food, feed, and fiber. These funds are allocated for high-priority aspects of organic agricultural systems research, education, and extension. Priority concerns encompass biological, physical, and social sciences (including economics).

Risk Management Education
The Risk Management Education Competitive Grants program was authorized in the Agricultural Risk Protection Act, signed into law in August 2000. The legislation provides $5 million to CSREES which, in turn, competitively awards four regional RME centers located as follows: Northeast Region at the University of Delaware; North Central Region at the University of Nebraska-Lincoln; Southern Region at the Texas A&M University, Stephenville, TX; and Western Region at the Washington State University. The Digital Center for Risk Management Education at the University of Minnesota, also awarded a grant, provides electronic and other support to the four regional RME centers and maintains a library of accomplishments and other risk management-related materials. The program competitively awards grants to address national, regional and local risk management issues to allow U.S. producers to have the knowledge, skills and tools needed to make informed risk management decisions for their operations.

Extension Activities

All universities engage in research and teaching, but the nation's more than 100 land-grant colleges and universities, have a third critical mission—extension. "Extension" means "reaching out," and, along with teaching and research, land-grant institutions "extend" their resources, solving public needs with college or university resources through non-formal, non-credit programs. These programs are largely administered through thousands of county and regional extension offices in nearly all of the Nation's 3,150 counties, which bring land-grant expertise to the most local of levels. And both the universities and their local offices are supported by CSREES, the federal partner in the Cooperative Extension System (CES). CSREES plays a key role in the land-grant extension mission by distributing annual Congressionally-appropriated formula funding to supplement state and county funds. CSREES affects how these formula funds are used through national program leadership to help identify timely national priorities and ways to address them.

Formula Programs

Smith-Lever Formula 3(b) and (c)
Federal base program funds authorized under Smith-Lever Act 3(b) and (c) and allocated on a formula basis support Cooperative Extension programs at the 1862 land-grant universities. Funds are allocated on a formula basis to support cooperative extension work in 50 States, Puerto Rico,

Guam, Virgin Islands, Micronesia, American Samoa, and Northern Mariana Islands. The States are required to spend no less than 25 percent of Smith-Lever funds on multi-state or regional extension activities. One hundred percent non-federal match is required for 1862 institutions, and 50 percent match with potential waiver applies to territories. The District of Columbia receives extension funds through separate legislative authority.

1890 Institutions
The 1890 Extension program supports the educational base program as well as specific national initiatives at the 1890 Land-Grant Institutions and Tuskegee University. Funding for the Extension programs at these institutions primarily addresses the needs of small-scale and minority agricultural producers and other limited-resources audiences. The 2002 Farm Security and Rural Investment Act requires a
100 percent match of federal dollars. The Secretary may waive the match above 50 percent if an institution is incapable of meeting that requirement.

Smith-Lever 3(d) Programs
These targeted funds are allocated to the states to address special programs or concerns of regional and national importance and are primarily distributed according to the extent of the problem that requires attention in each state. The following extension programs are supported:

- ***Expanded Food and Nutrition Program***
  EFNEP is designed to assist limited resource audiences in acquiring the knowledge, skills, attitudes, and changed-behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being.

- ***Pest Management***
  Integrated Pest Management promotes minimized pesticide use, enhanced environmental stewardship, and sustainable systems. This program targets three areas: commercial agricultural producers, urban audiences (including parks and schools), and natural resources. The goals for the National IPM program (June 2, 2003) are to: 1) improve economic benefits related to the adoption of IPM practices; 2) reduce potential human health risks from pests and the use of IPM practices; and 3) minimize adverse environmental effects from pests and the use of IPM practices.

- ***Farm Safety***
  The primary purpose of this funding is to provide seed money to develop farm safety programs that meet the states' most critical needs. CSREES participates in regional partnership development meetings and funds farm safety initiatives in U.S. states and territories.

- ***Children, Youth, and Families at Risk***
  Through an annual Congressional appropriation for the National Children, Youth, and Families at Risk (CYFAR) Program, CSREES allocates funding to land-grant university extension services for community-based programs for at-risk children and their families. Since 1991, CYFAR has supported programs in more than 600 communities in all U.S. states and territories. State and local public and private organizations have contributed cash and in-kind resources that match or exceed the federal appropriation.

- ***Youth Farm Safety Education and Certification***

The scope of this project is to develop and assess the effectiveness of a hazardous occupation certification program for youth employed in agriculture and determine the resources required for implementation of a national certification program.

- ***Sustainable Agriculture Research and Education (SARE)***
  Authorizes a program to facilitate and increase scientific investigation and education in order to reduce the use of chemical pesticides, fertilizers, and toxic natural materials in agricultural production; improve low-input farm management; take advantage of the experiences and expertise of farmers and ranchers through their direct participation and leadership in projects; and transfer reliable and timely information to farmers and ranchers. Grants are awarded on a regional basis by panels which include producers as well as scientific experts. (See also SARE in Research and Education above)

- ***Extension Indian Reservation Program***
  The Extension Indian Reservation Program (EIRP) was authorized by the 1990 Farm Bill (P.L. 101-624). This measure directs that the "Secretary of Agriculture, acting through the Extension Service, shall establish appropriate extension education programs on Indian Reservations and tribal jurisdictions." The legislation specified consultation with the Bureau of Indian Affairs, the Intertribal Agriculture Council, and the Southwest Indian Agriculture Association in establishing these extension programs.

Other Extension Programs

Extension Services at the 1994 Institutions
The purpose of the Tribal Colleges Extension Program is to provide funding for the 1994 Land-Grant Institutions to conduct non-formal education and outreach activities that will improve conditions in Native American communities. Through a competitive application process, awards are made in one or more of the following extension base program areas: Agriculture; Community Resources and Economic Development; Family Development and Resource Management; 4-H and Youth Development; Leadership and Volunteer Development; Natural Resources and Environmental Management; and Nutrition, Diet and Health.

Renewable Resources Extension Act
The Renewable Resources Extension Act (RREA) provides funding for expanded extension programs in forest and range resources. Funds are distributed to all 1862 and 1890 land grant universities and Puerto Rico, Virgin Islands and Guam.

Rural Health and Safety
The Rural Health and Safety Education Act of 1990 helps rural residents avoid the numerous obstacles to maintaining their health status. This program maintains the ongoing rural health projects in Mississippi and Louisiana that focus on training health care professionals in rural areas.

1890 Facilities (Section 1447)
(Payments to 1890 Colleges, Tuskegee University, and West Virginia State College)
Public Law 95-113, as amended, provides support to the 1890 Land-Grant Colleges and Universities for fostering, developing, implementing and improving extension educational programs to benefit their clientele. In accordance with the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185, eligible State institutions are required to submit a five-year Plan of Work to CSREES for approval before these formula funds are distributed.

Federal Administration

- *Other*
  Provides a portion of the general operating funds from the federal staff, and national program planning, coordination, and program leadership for the extension work in partnership with the states and territories.

- *Ag in the Classroom*
  Agriculture in the Classroom is a grassroots program coordinated by the United States Department of Agriculture. Its goal is to help students gain a greater awareness of the role of agriculture in the economy and society, so that they may become citizens who support wise agricultural policies. The program is carried out in each state, according to state needs and interests, by individuals representing farm organizations, agribusiness, education and government.

Publicly-Funded Agricultural Research, Education, and Extension and Tracking Some of the Investment with CSREES Databases

The U.S. system of publicly-funded research, education, and extension in the areas of food, agriculture, and natural resources supports a diverse, complex knowledge base that is vital to food and fiber production, conservation of natural resources, and to the economic well being of the nation. The scientific expertise available through the federal and state research and education system constitutes a valuable national resource with the flexibility to respond quickly to changes in demand, threats to sustainability, and concerns about environmental quality. CSREES contributes a unique national perspective to the network of research, education, and extension partnerships maintained by the USDA and cooperating institutions. This vantage point is essential to the agency's regional and national coordination and tracking of public resources invested to address diverse research and outreach problems.

The Growing Need for Research, Education and Extension

In recent years, the need for problem-solving research and extension activities in food, agriculture, and natural resources has expanded. Changes in this agenda were given impetus by the U.S. Congress when it reauthorized USDA programs under the Food, Agriculture, Conservation, and Trade Act of 1990. This legislation emphasized food and fiber needs, long term viability and competitiveness, improvement of the quality of rural life, the assurance of supply of safe food, and enhancement of the environment and natural resource base. The growing consumer interest in environmental and social issues, as well as the increased complexity of contemporary research problems, has necessitated an increase in multi-disciplinary and interdisciplinary research, education, and extension work.

The evolving U. S. system of food, agricultural, and environmental research, education, and extension encompasses the programs of state agricultural experiment stations (SAES); colleges and departments of forestry, natural resources, family and consumer sciences, and veterinary medicine; 1890 and 1994 land-grant institutions and Tuskegee University; other cooperative institutions, including state and private colleges and universities; and USDA agencies (Agricultural Research Service, Economic Research Service, Forest Service, and Natural Resource Conservation Service) and federal departments. Research and extension programs are closely linked to and complement the teaching activities of the land-grant institutions. Additionally, research programs are integral to graduate education, through which scientists are

prepared to confront future research challenges. For Science and Education Impacts see: http://www.csrees.usda.gov/newsroom/impacts/04index_pdf.html

The teaching partnership is the most recent addition (1977) to the federal-state partnership comprising research, extension, and education. CSREES teaching initiatives support human capital development through programs that strengthen agricultural and natural resource sciences literacy in K-12 education, improve higher education curricula, modernize institutional academic capacity, and increase the diversity and quality of future graduates to enter the scientific and professional workforce. CSREES assists the nation's schools, colleges, and universities to develop essential strategies to meet future academic challenges. These include expanding student recruitment, preparing graduates in areas of national need, maintaining curricular relevance through innovative degree programs and technologies, developing academic infrastructure, and endowing graduates with problem-solving, communication, and hands-on collaborative learning skills and experiences they will need to lead scientific inquiry and meet the challenges of an ever-changing world.

Tracking CSREES and Land-Grant Activities

The research summaries utilized in this report are based on activities documented in the USDA's Current Research Information System (CRIS) and in part from annual reports of National Research Initiative and Cooperative Forestry Research projects, state annual reports, impact statements, and information provided by the CSREES National Program Leaders. CRIS information includes funded research that is either in progress or is recently completed, objectives and procedures of each project (AD-416), research Knowledge Area and other classifications (AD-417), annual financial and management data (AD-419), and annual progress including accomplishments (AD-421). The scope of CRIS content includes essentially all projects supported or conducted by the USDA and under the aegis of the SAES. Some projects documented in CRIS are conducted by non-federal partner institutions without support from USDA funding. However, CRIS does not include all university-based research supported by sources other than the USDA. The focus of the portfolio analyses is on the projects supported or performed by CSREES. As the agricultural research base expands, including more institutions and scientists outside USDA and SAES in agricultural and related research, the management data in CRIS should be viewed as conservative estimates. This shortage of data may be most significant in the research areas at the boundaries of agricultural research.

The CSREES portfolio review includes research, education, and extension programs categorized by Knowledge Areas (KA). Each CRIS project is categorized by Research Problem Areas (RPAs that equate directly to the KAs addressed in this report. The KAs provide a common basis for analyzing the targeted areas under review. CRIS has been an operational system since 1968 and provides a resource of fiscal data with a consistent basis since fiscal year 1970. CRIS data were designed to provide science content, but not financial accounting, which is conducted and controlled through processes administered by the Funds Management Branch under the Office of Extramural Programs in CSREES. The structure of CRIS information can be used in the broad sense for program accountability.

At present, the information collected by CRIS on activities relevant to program accountability is essentially limited to research, and, more recently, education. Efforts are underway to capture award and funding information for CSREES programs in education and extension. Development is underway on a new electronic web-based reporting system to capture formula-funded outcomes, with the logic model as the fundamental element to structure data collection. These data will accommodate an integrated approach to CSREES portfolio analyses. Therefore, quantitative data are not yet consistently available for extension activities for this portfolio review.

More comprehensive CSREES accountability reporting is being pursued with maximum effort but will require several years to be completed. Implementation will most likely occur in phases drawing upon existing capabilities of CRIS, the Research, Education and Economics Information System (REEIS), Food and Agricultural Education Information System (FAEIS), and other established CSREES data and information systems. The integration of existing systems with expanded functionality and/or additional systems to address new segments of the process will provide more efficient collection and distribution of information. The integrated approach will reduce the effort and resource requirements for CSREES and all of the partnership while encompassing research, education and extension in a consistent approach allowing more effective program accountability.

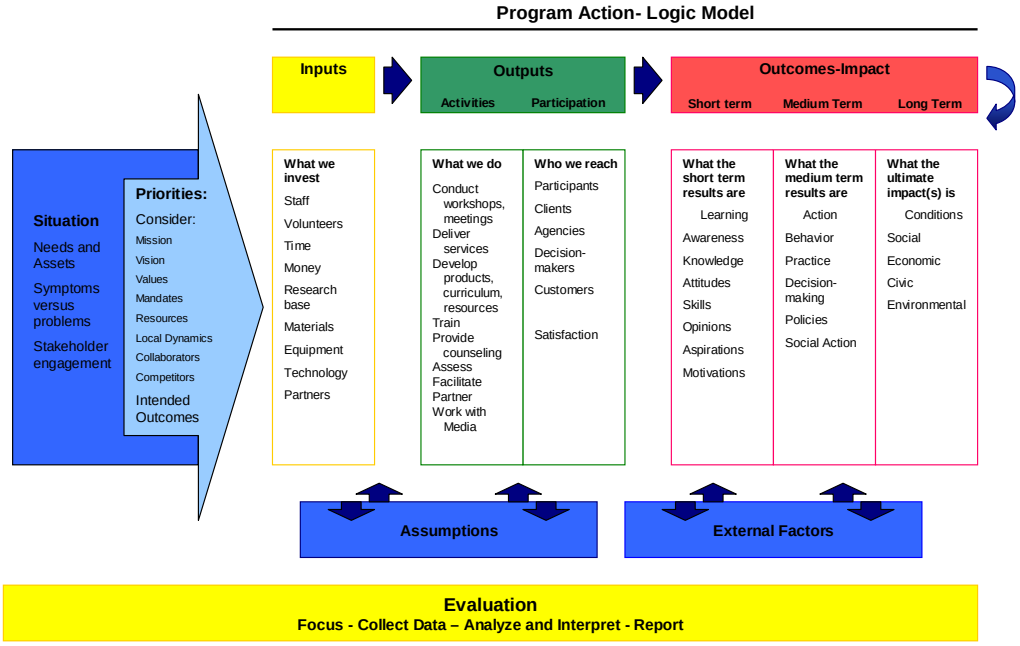
Portfolio Self-Review Document Organization

This first Section of the report contains a general description of the portfolio review process (PREP) and of CSREES, its vision, mission, functions, and funding authorities.

Section II contains a description of the overall portfolio and its component Knowledge Areas. A conceptual "logic" model common to program evaluation is used to illustrate the main components of the Agency's investments and work, the planned outcomes, and the logic of how the planned work is designed to effect the desired results in solving national problems, meeting national needs and achieving the mission of the Agency (see Chart 1 which provides a generic logic model as an example of how a program is conceptualized. Section II also provides data on performance measures identified via the logic model, results of evaluation studies, success stories and planned new directions for Agency efforts. The substantive descriptions of the portfolio and its components were prepared by CSREES National Program Leaders – topic area experts who manage programs or topic-related KA activities.

Generic Logic Model

Program Development
Planning-Implementation-Evaluation



The Government Accountability Office (GAO), the evaluation and oversight agency for Congress, promotes the use of logic models in good evaluation practice and has praised CSREES as a model in its use of logic models. The new Plan of Work/Annual Report guidelines for planning and accountability submissions for formula funds via the new web-based electronic reporting system under development require the use of the logic model and provide an explanation, contained in Table 1.

Table 1: Logic Model, Plan of Work/Annual Report Guidance

Program Logic Model: the conceptual tool for planning and evaluation which displays the sequence of actions that describe what the science-based program is and will do – how investments link to results. Included in this depiction of the program action are six core components:

1. **Identification of the national problem, need, or situation that needs to be addressed by the program.** The conceptual model will delineate the steps that are planned, based on past science and best theory, to achieve outcomes that will best solve the identified national problems and meet the identified needs. The medium term outcomes should reflect the actual program results, while the long term outcomes should reflect the larger societal influence.

2. **Assumptions:** the beliefs we have about the program, the people and processes involved, and the context and the way we think the program will work. These science-based assumptions are based on past evaluation science findings regarding the effects and functioning of the program or similar programs, program theory, stakeholder input, etc.

3. **External Factors:** the environment in which the program exists includes a variety of external factors that interact with and influence the program action. Evaluation plans for the program should account for these factors, which are alternative explanations for the outcomes of the program other than the program itself. Strong causal conclusions about the efficacy of the program must eliminate these environmental factors as viable explanations for the observed outcomes of the program. These identify the factors for which the scientific evaluation design must control in order to make causal conclusions.

4. **Inputs:** resources, contributions, and investments that are provided for the program. This includes federal, state, and local spending, private donations, volunteer time, etc.

5. **Outputs:** activities, services, events, and products that are intended to lead to the program's outcomes in solving national problems by the causal chain of events depicted in the logic model. These activities and products are posited to reach the people who are targeted as participants or the audience or beneficiaries of the program. Output performance measures often include tallies, such as the number of persons targeted and reached (direct and indirect contacts), the number and type of grants awarded, etc.

   An understanding of the actual inputs and outputs posited in the logic model comprises the process evaluation for the program. It is important to stop and consider these data, as they tell us what the REAL program is—that is, what has actually been implemented. This tells us to what the eventual observed outcomes really relate. Often times what federal managers plan and describe in the logic model is **not** what is eventually implemented in the field, and it is important to note what the true "program" really is. The effects of the planned program may actually be unknown, because the planned program NEVER ACTUALLY OCCURRED. It is important to understand and properly report all of this.

   In addition, it is these PROCESS factors that managers actually control, and which they can manipulate to improve the program based on the evaluation feedback.

6. **Outcomes:** planned results or changes for individuals, groups, communities, organizations, or systems. These include short-, medium-, and long-term outcomes in the theorized chain of causal events that will lead to the planned solution of the identified national problems or meet national needs. These can be viewed as the public's return on its investment, i.e., the value-added to society in the benefits it reaps from the program. Examples include research findings, changes in knowledge, skill development, and behavior (such as the number of people adopting a new technology or using a new product), capacities or decision-making, and policy development. Impact in this model refers to the ultimate consequence or effects of the program (e.g., increased economic security, improved air quality). Impact refers to the ultimate, longer-term changes in social, economic, civic, or environmental conditions.

   This is also where the logic model loop is completed – the identified national problem should eventually be solved here. When we use the logic model, it should be clear to all involved in the program what it is about – what problems it intends to solve, how it is going to do it, how performance will be measured, and what ultimate outcomes and benefits we can expect. Evaluators can quickly assess what performance measures will be needed, and work with program managers to obtain the needed data.

While the logic model has been in use for some time, the agency has attempted to use it to highlight work accomplished in the evaluation period. As such, the generic logic model has been modified to reflect the work of the agency. The logic model and its various components are presented more at length in Section II (p II-X)

Other graphics are used to explain research investments – Logic Models and Honeycombs. For each portfolio, the charts show the relevant component Knowledge Areas. For each Knowledge Area, the Honeycombs depict the main areas of research identified by the scientific community that must be studied in order to address the identified Knowledge Area (see Generic Honeycomb, I-34). Honeycombs show CSREES accomplishments (shown by each area of investigation) and the identified needs (shown by each area of investigation) for the Knowledge Area. The identified needs are usually translated into announcements of Requests for Applications (RFAs) for grants. Such charts are also used to illustrate how CSREES teams with its federal agency partners in studying an area by adding in the names of other agencies targeted to specific parts of the honeycomb.

Not only can such charts be used for planning and accountability purposes, they can also be employed by NPLs to explain CSREES work and its needs for coverage of investigation in certain areas to meet national objectives.

Section III contains a description of each of the KAs mentioned in Section II and uses the same logic model format. The goal for each KA description is to provide concise, comprehensive insights into these activities and provide performance data to enable the Panel to assess CSREES outcomes.

- Situation
- Assumptions
- External Factors
- Inputs
- Outputs
- Outcomes
- Performance Indicators
- Success Stories
- New Directions

Section IV draws on the previous Sections and supplementary evidentiary materials to specifically addresses the various dimensions of OMB's Research and Development Criteria: relevance, quality, and performance. It is on these dimensions that the panel will be asked to rate the Agency's work for the portfolio and it is these portfolio review scores that will be used to inform the Program Assessment Rating Tool (PART) which will result in an overall PART score for the Agency's work on a related strategic goal. The portfolio score will also be used in Budget and Performance Integration submissions. For each of the dimensions, descriptions and evidence are provided that best illustrate how the Portfolio met its strategic objective for the 1999-2003 timeframe. Because the PART, Budget and Performance Integration, and this PREP are new evaluation efforts, there might not be data available during the reporting timeframe for the new performance measures now identified or required due to the portfolio process or new strategic goals.

While significant progress has been accomplished under this portfolio, the nation is facing new threats to its agricultural and natural resource-based industries. Experience from work

accomplished thus far places the agency, in collaboration with its partners, to generate and use new knowledge to safeguard against these new threats.